UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/585,554	03/19/2007	Gregory I. Bohach	12136.0003USWO	2238

24197 7590 08/21/2009

KLARQUIST SPARKMAN, LLP
121 SW SALMON STREET
SUITE 1600
PORTLAND, OR 97204

EXAMINER	
GANGLE, BRIAN J	

ART UNIT	PAPER NUMBER
1645	

MAIL DATE	DELIVERY MODE
08/21/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/585,554	BOHACH, GREGORY I.	
	Examiner	Art Unit	
	Brian J. Gangle	1645	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 March 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 July 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/6/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claims 1-17 are pending and are currently under examination.

Information Disclosure Statement

The information disclosure statement filed on 7/6/2006 has been considered. An initialed copy is enclosed.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-9 and 11-17 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The instant claims are drawn to methods of reducing the somatic cell count in milk, comprising administering to a mammal an effective amount of a composition comprising a toxin. Dependent claims limit the toxin to streptococcal or staphylococcal toxins, particularly to staphylococcal enterotoxin C (SEC), and more particularly to SEC1-12 (SEQ ID NO:17).

The claims encompass the administration of any type of toxin, in any manner, to a mammal to reduce the somatic cell count in milk.

The specification teaches that high somatic cell counts in milk are used as an indicator of mastitis. In dairy cows, the most common source is *S. aureus*, which produces enterotoxins that cause excessive immune cell stimulation and lead to shock, hypotension, and immunosuppression. Staphylococcal enterotoxins also have emetic properties. The specification discloses examples using a mutated form of SEC, with a deletion of residues 95-106 (termed SEC1-12, with the sequence of SEQ ID NO:17), and wild-type SEC. SEC administered to cows led to a large increase in somatic cells and the specification states "the presence of toxin alone

greatly increases the production and/or release of somatic cells into the milk" (page 7, final paragraph). Administration of SEQ ID NO:17 led to a decrease in the somatic cell count in milk.

The art echoes the teachings of the specification. Ferens *et al.* (Infect. Immun., 66:573-580, 1998) teach that staphylococcal superantigens have the potential to affect the bovine immune system in a manner that could promote staphylococcal persistence and infections (page 577, column 1). In addition, the art teaches that SEC1-12 has greatly reduced toxicity and states that SEC1-12 can be used as a vaccine (Lee *et al.*, WO01/60851, 2001, IDS filed on 7/6/2006, page 3, lines 10-17). Lee *et al.* also teach the use of a molecule called SEC-SER, which is identical to SEC1-12, with the exception of one amino acid, as a vaccine against mastitis in cows (page 5, lines 1-4 and page 6, lines 2-6).

The written description requirement for a claimed genus may be satisfied through sufficient description of a representative number of species by actual reduction to practice, reduction to drawings, or by disclosure of relevant, identifying characteristics, i.e., structure or other physical and/or chemical properties, by functional characteristics coupled with a known or disclosed correlation between function and structure, or by a combination of such identifying characteristics, sufficient to show the applicant was in possession of the claimed genus. See *Eli Lilly*, 119 F.3d at 1568, 43 USPQ2d at 1406. A "representative number of species" means that the species which are adequately described are representative of the entire genus. Thus, when there is substantial variation within the genus, one must describe a sufficient variety of species to reflect the variation within the genus. The disclosure of only one species encompassed within a genus adequately describes a claim directed to that genus only if the disclosure "indicates that the patentee has invented species sufficient to constitute the gen[us]." See *Enzo Biochem*, 323 F.3d at 966, 63 USPQ2d at 1615; *Noelle v. Lederman*, 355 F.3d 1343, 1350, 69 USPQ2d 1508, 1514 (Fed. Cir. 2004)

With the exception of SEQ ID NO:17, the specification does not disclose any toxin that is shown to be capable of reducing the somatic cell count in milk. In fact, the specification shows instead (and specifically states) that toxin alone greatly increases the somatic cell count in milk. The specification does not describe what portions of SEC must be present or which must be altered in order to produce claimed function of a reduction in somatic cell count. While a single example with a complete structure is provided (i.e., SEQ ID NO:17), no correlation is shown

between this structure and the function required by the claims. There is no indication that any toxin other than SEC1-12 and SEC-SER would reduce the somatic cell count in milk. Therefore, with the exception of the method utilizing SEC1-12 (SEQ ID NO:17) the claims do not meet the written description requirement.

Claims 1-9 and 11-17 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a method of reducing the somatic cell count in milk, comprising administering to a mammal an effective amount of a composition comprising SEC1-12 (SEQ ID NO:17), does not reasonably provide enablement for said methods utilizing any toxin. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims.

Enablement is considered in view of the Wands factors (MPEP 2164.01(A)). These include: nature of the invention, breadth of the claims, guidance of the specification, the existence of working examples, state of the art, predictability of the art and the amount of experimentation necessary.

In re Fisher, 427 F.2d 833, 839, 166 USPQ 18, 24 (CCPA 1970) states, "The amount of guidance or direction needed to enable the invention is inversely related to the amount of knowledge in the state of the art as well as the predictability in the art." "The "amount of guidance or direction" refers to that information in the application, as originally filed, that teaches exactly how to make or use the invention. The more that is known in the prior art about the nature of the invention, how to make, and how to use the invention, and the more predictable the art is, the less information needs to be explicitly stated in the specification. In contrast, if little is known in the prior art about the nature of the invention and the art is unpredictable, the specification would need more detail as to how to make and use the invention in order to be enabling" (MPEP 2164.03). The MPEP further states that physiological activity can be considered inherently unpredictable. Thus, Applicant assumes a certain burden in establishing that inventions involving physiological activity are enabled. All of the Wands factors have been considered with regard to the instant claims, with the most relevant factors discussed below.

Nature of the invention: The instant claims are drawn to methods of reducing the somatic cell count in milk, comprising administering to a mammal an effective amount of a

composition comprising a toxin. Dependent claims limit the toxin to streptococcal or staphylococcal toxins, particularly to staphylococcal enterotoxin C (SEC), and more particularly to SEC1-12 (SEQ ID NO:17).

Breadth of the claims: The claims encompass the administration of any type of toxin, in any manner, to a mammal to reduce the somatic cell count in milk.

Guidance of the specification/The existence of working examples: The specification teaches that high somatic cell counts in milk are used as an indicator of mastitis. In dairy cows, the most common source is *S. aureus*, which produces enterotoxins that cause excessive immune cell stimulation and lead to shock, hypotension, and immunosuppression. Staphylococcal enterotoxins also have emetic properties. The specification discloses examples using a mutated form of SEC, with a deletion of residues 95-106 (termed SEC1-12, with the sequence of SEQ ID NO:17), and wild-type SEC. SEC administered to cows led to a large increase in somatic cells and the specification states "the presence of toxin alone greatly increases the production and/or release of somatic cells into the milk" (page 7, final paragraph). Administration of SEQ ID NO:17 led to a decrease in the somatic cell count in milk.

State of the art: The art echoes the teachings of the specification. Ferens *et al.* (Infect. Immun., 66:573-580, 1998) teach that staphylococcal superantigens have the potential to affect the bovine immune system in a manner that could promote staphylococcal persistence and infections (page 577, column 1). In addition, the art teaches that SEC1-12 has greatly reduced toxicity and states that SEC1-12 can be used as a vaccine (Lee *et al.*, WO01/60851, 2001, IDS filed on 7/6/2006, page 3, lines 10-17). Lee *et al.* also teach the use of a molecule called SEC-SER, which is identical to SEC1-12, with the exception of one amino acid, as a vaccine against mastitis in cows (page 5, lines 1-4 and page 6, lines 2-6).

With the exception of SEQ ID NO:17, the specification does not disclose any toxin that is shown to be capable of reducing the somatic cell count in milk. In fact, the specification shows instead (and specifically states) that toxin alone greatly increases the somatic cell count in milk. The specification does not describe what portions of SEC must be present or which must be altered in order to produce claimed function of a reduction in somatic cell count. One of skill in the art would have no indication that any toxin other than SEC1-12 and SEC-SER would reduce the somatic cell count in milk, and would in fact expect that most toxins would increase the

somatic cell count rather than decrease it.

Therefore, in view of the lack of support in the art and specification, it would require undue experimentation on the part of the skilled artisan to use the full scope of the method as claimed.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 4-9, and 11-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee *et al.* (WO01/60851, 2001, IDS filed on 7/6/2006).

The instant claims are drawn to methods of reducing the somatic cell count in milk, comprising administering to a mammal an effective amount of a composition comprising a toxin.

Lee *et al.* disclose SEC1-12, which has greatly reduced toxicity and states that SEC1-12 can be used as a vaccine (page 3, lines 10-17). Lee *et al.* also teach the use of a molecule called SEC-SER, which is identical to SEC1-12, with the exception of one amino acid, as a vaccine against mastitis in cows (page 5, lines 1-4 and page 6, lines 2-6). SEC1-12 and SEC-SER are mutant versions of staphylococcal enterotoxin C, which, when administered as a vaccine to prevent mastitis in cows, would necessarily decrease the somatic cell count in the milk of the cow. Lee *et al.* disclosed administration of SEC-SER at dosages of 4mg and 0.4 mg, as well as administration of a plurality of doses (table 2).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee *et al.* (WO01/60851, 2001, IDS filed on 7/6/2006) in view of USDA (Bulk Tank Milk Somatic Cell Counts and Your Milk Quality Assurance Program, 1994).

The instant claims are drawn to methods of reducing the somatic cell count in milk, comprising administering to a mammal an effective amount of a composition comprising a toxin.

Lee *et al.* disclose SEC1-12, which has greatly reduced toxicity and states that SEC1-12 can be used as a vaccine (page 3, lines 10-17). Lee *et al.* also teach the use of a molecule called SEC-SER, which is identical to SEC1-12, with the exception of one amino acid, as a vaccine against mastitis in cows (page 5, lines 1-4 and page 6, lines 2-6). SEC1-12 and SEC-SER are mutant versions of staphylococcal enterotoxin C, which, when administered as a vaccine to prevent mastitis in cows, would necessarily decrease the somatic cell count in the milk of the cow. Lee *et al.* disclosed administration of SEC-SER at dosages of 4mg and 0.4 mg, as well as administration of a plurality of doses (table 2).

Lee *et al.* differs from the instant invention in that they do not disclose administration of SEC-SER in a mammal with a somatic cell count of greater than 257,000 per ml of milk and, while they disclose the use of SEC1-12 as a vaccine, do not disclose administration of SEC1-12 to mammals that are capable of producing milk (thus reducing the somatic cell count).

The USDA publication discloses that the average somatic cell count of milk was 257,000 cells per milliliter.

It would have been obvious to one of ordinary skill in the art, at the time of invention, to administer SEC-SER to a mammal with a cell count greater than 257,000 per ml of milk because counts higher than this are higher than average, and thus indicate possible infection.

It would have been obvious to one of ordinary skill in the art, at the time of invention, to use SEC1-12 (SEQ ID NO:17) for vaccination against mastitis in cows because it is disclosed as a vaccine and Lee *et al.* used it as a basis for their vaccine against mastitis in cows.

One would have had a reasonable expectation of success because Lee *et al.* disclosed SEC1-12 and SEC-SER as vaccines.

Conclusion

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian J. Gangle whose telephone number is (571)272-1181. The examiner can normally be reached on M-F 7-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Mondesi can be reached on 571-272-0956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Brian J Gangle/
Examiner, Art Unit 1645

/Robert B Mondesi/
Supervisory Patent Examiner,
Art Unit 1645